

Tucson Plant Materials Center Year 2003 Progress Report of Activities

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Who We Are

The Tucson Plant Materials Center (PMC) is a division of the United States Department of Agriculture's Natural Resources Conservation Service (NRCS). It is part of a network of 26 Plant Materials Centers located throughout the United States to develop and evaluate native plants. Operations began at the Tucson PMC in 1935. The Center was officially listed on the National Register of Historic Places in 1997; it is the first PMC to be so recognized. The Tucson PMC serves areas located in the Sonoran, Mohave, and parts of the Chihuahuan deserts located in Arizona, southeastern California, southern Nevada, southern Utah, and southwestern New Mexico. The Tucson PMC is located in northwest Tucson, just east of Interstate 10, on Romero Road just south of Prince Road.

What We Do

The evaluation of native plants as well as cultural and management practices are carried out at the federally owned 45-acre farm. Conservation plant material and practices are also evaluated throughout the PMC service area. The mission of the Tucson PMC is to provide quality vegetative solutions to conservation problems. The Tucson PMC conducts various studies and plantings and participates in various cooperative efforts to address an array of resource issues in the following areas:

1. Rangeland
2. Mined Land
3. Urban Lands
4. Cropland
5. Riparian Areas

The Tucson PMC actively provides technical assistance to NRCS Field Offices, Resource Conservation and Development (RC&D) groups, Conservation districts, federal and state agencies, and private landowners. This interagency cooperation offers many opportunities for joint development and release of plant materials as well as for exchange of information, seed, and planting stock..

A brief summary of year 2003 accomplishments follows. To receive more detailed information on specific projects request a copy of the 2002 Annual Technical Report from the address or website listed above.

Native Grass Demonstration Nursery Established

A grass demonstration nursery was established at the Tucson Plant Materials center in 2003. This nursery consists of warm and cool season native plant material (Table 1). The nursery will be used for training and for informal evaluation.



Table 1. Species and cultivars in the grass demonstration nursery at the Tucson Plant Materials Center.

Eastern Gamagrass 'Pete'	Arizona Fescue 'Redondo'
Indian Ricegrass 'Rimrock' 'Nezpar' 'Paloma'	Switchgrass 'Alamo' 'Kanlow' 'Blackwell'
Green Sprangletop 'Marfa'	Little Bluestem 'Cimmaron'
Bottlebrush Squirreltail 'Tusas' 'Sandhollow'	Blue Grama 'Alma' 'Hachita'
Galleta Grass 'Viva'	Big Bluestem 'Earl'
Sand Bluestem 'Elida' 'Garden'	Alkali Sacaton 'Saltalk'
Sideoats Grama 'Haskel' 'Vaughn' 'Niner'	Cane Bluestem Saltillo Germplasm Grant Germplasm
Spike Dropseed Potter County Germplasm	Sand Dropseed Borden County Germplasm
Arizona Cottontop 'Loetta'	

Spike Dropseed Ready for Release

In 2003 production of spike dropseed was increased to 1 acre in anticipation of release in 2004. Spike dropseed (*Sporobolus contractus*) is a native warm season bunch grass that is commonly found on dry, sandy or gravelly soils in southeastern Arizona to Colorado, Texas, southeastern California, and Sonora, Mexico. The collection is comprised of plants from 44 locations from southeastern Arizona and utilizes the Convergent Divergent Plant Improvement Strategy (CDI). Step 1, **CONVERGENCE**, brings a collection of plants to a common point (PMC farm) and an equal number of plants from each location are established in a production field. Equal quantities of seed are

collected from each plant. This seed is used to produce plants which are established in various environments. Natural selection is used to determine the best plants in each environment, **DIVERGENCE**. Three sites were selected in Southern Arizona representing low, medium, and high rainfall with similar levels of Lehmann's lovegrass competition. After one year seed was



collected from selected individuals at these sites. The seed from selected individuals was used to develop a breeder's

seed field. The objective of this project is to develop a genetically diverse population of spike dropseed that can be used as a native replacement for Lehmann's lovegrass.

Native Grass Bales Used to Seed Structures on Altar Valley Project

The Palo Alto Ranch in about 50 miles southwest of Tucson was established in the 1880's as a camp and school. In the 1930s it was sold and continued operation as a school and line-camp. In the 1950's it was sold again and operated as an independent unit. The ranch consists of 33,000 acres of state and private rangeland in the Upper Sonoran Desert. Over the past 100 years various owners grazed the



ranch heavily and did little to combat the extensive erosion. The Altar Wash, which bisects the ranch, has extreme

down-cutting and bank-cutting along the 35 miles to the Santa Cruz River. Side tributaries to the Altar Wash are actively head-cutting, leaving the historic floodplain dry and barren and contributing to heavy sediment loads and flooding downstream. A recent Rangeland Resource assessment of the Altar Valley by the Altar Valley Conservation Alliance,

identified the bottomlands of the Palo Alto ranch an area with the lowest range health ratings and highest resource values and concerns. The ranch came under new ownership in 2000 with a commitment to restoration and grazing management. A grant was obtained from the Arizona Department of

Environment
al Quality
under Section
319 of the
Clean Water
Act, to start
the process.
Several
erosion
control dams



and water-spreading dikes were constructed on the floodplain to stop the valley side erosion. Giant sacaton was seeded into the areas immediately above dikes and diversions to reestablish native bottomland vegetation. Native grass bales supplied by the NRCS Tucson Plant Materials Center are being used to mulch dike and dam areas. Revegetation of rangeland disturbed by projects such as the Palo Alto Ranch Erosion Control 319 Projects may be facilitated by using native grass hay bales. Rather than typical seeding and mulching, dikes and sediment control structures were seeded



by spreading
straw from
the Tucson
Plant
Materials
Center's seed
production
fields.
Native grass
mulch from

seed production fields not only persists longer because of longer and stronger stems, but also contains seed heads missed during harvest. This type of native grass straw applied with a straw spreader or by hand enables the area to be seeded and mulched in one treatment.

Irrigated Pasture Trials

This study is investigating proper species selection, irrigation and maintaining a viable and productive

irrigated pasture in the arid environment of southern Arizona. Irrigated pasture provides forage for livestock, is beneficial during breeding and calving periods, serves as an exercise area for horses, and most importantly serves to protect soil and reduce offsite sediment deposition.

In May 2000 the Tucson PMC established an irrigated pasture trial to compare forage production of 4 introduced species and 3 native species. Two additional native species were added in 2003 (Table 1).

Table 1. Grass species represented in the irrigated pasture trials at the Tucson Plant Materials Center.

<u>Grass</u>	<u>2000</u>	<u>Origin*</u>
'Jessup' tall fescue (<i>Festuca arundinacea</i>)		I
common bermuda grass (<i>Cynodon dactylon</i>)		I
giant bermuda grass (<i>Cynodon dactylon</i>)		I
'Cheyenne' bermuda grass (<i>Cynodon dactylon</i>)		I
Giant Sacaton (<i>Sporobolus wrightii</i>)		N
'Loetta' Arizona cottontop (<i>Digitaria californica</i>)		N
'Vaughn' sideoats grama (<i>Bouteloua curtipendula</i>)		N
	<u>2003</u>	
Saltillo germplasm Cane Bluestem (<i>Bothriochloa barbinodis</i>)		N
Pima pappusgrass (<i>Pappophorum vaginatum</i>)		N

*I=introduced N=native

Species planted in 2000 were harvested 6 times during FY2003.



The fresh and dry weight of forage was recorded.

Although native grass such as sideoats grama are slower to

establish than bermuda grass, sideoats grama was the best forage producer in 2002 with no supplemental fertilization. In 2003 fertilizer was applied which increased the yield of bermuda grass, but sideoats grama continued to provide comparable forage yields.



To learn more about these and other PMC activities visit our website at:

Plant-Materials.nrcs.usda.gov

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